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<120> MALATHION CARBOXYLESTERASE

<130> Attorney Docket No. 50179-051

<140> 09/068,960

<141> 1998-06-20

<150> PCT/AU96/00746

<151> 1996-11-22

<150> AU 6751

<151> 1995-11-23

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<170> PatentIn Ver. 2.0

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				245					250					255		
Gln	His	Arg	Ala	Phe	Thr	Leu	Ala	Lys	Leu	Ala	Gly	Tyr	Lys	Gly	Glu	
			260					265					270			
Asp	Asn	Asp	Lys	Asp	Val	Leu	Glu	Phe	Leu	Met	Lys	Ala	Lys	Pro	Gln	
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Asp	Leu	Ile	Lys	Leu	Glu	Glu	Lys	Val	Leu	Thr	Leu	Glu	Glu	Arg	Thr	
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Asn	Lys	Val	Met	Phe	Pro	Phe	Gly	Pro	Thr	Val	Glu	Pro	Tyr	Gln	Thr	
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Ala	Asp	Cys	Val	Leu	Pro	Lys	His	Pro	Arg	Glu	Met	Val	Lys	Thr	Ala	
				325					330					335		
Trp	Gly	Asn	Ser	Ile	Pro	Thr	Met	Met	Gly	Asn	Thr	Ser	Tyr	Glu	Gly	

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Leu Phe Phe Thr Ser Ile Leu Lys Gln Met Pro Met Leu Val Lys Glu					
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Leu Glu Thr Cys Val Asn Phe Val Pro Ser Glu Leu Ala Asp Ala Glu					
	370		375		380
Arg Thr Ala Pro Glu Thr Leu Glu Met Gly Ala Lys Ile Lys Lys Ala					
	385		390		395 400
His Val Thr Gly Glu Thr Pro Thr Ala Asp Asn Phe Met Asp Leu Cys					
		405		410	415
Ser His Ile Tyr Phe Trp Phe Pro Met His Arg Leu Leu Gln Leu Arg					
		420		425	430
Phe Asn His Thr Ser Gly Thr Pro Val Tyr Leu Tyr Arg Phe Asp Phe					
		435		440	445
Asp Ser Glu Asp Leu Ile Asn Pro Tyr Arg Ile Met Arg Ser Gly Arg					
		450		455	460
Gly Val Lys Gly Val Ser His Ala Asp Glu Leu Thr Tyr Phe Phe Trp					
		465		470	475 480
Asn Gln Leu Ala Lys Arg Met Pro Lys Glu Ser Arg Glu Tyr Lys Thr					
		485		490	495
Ile Glu Arg Met Thr Gly Ile Trp Ile Gln Phe Ala Thr Thr Gly Asn					
		500		505	510
Pro Tyr Ser Asn Glu Ile Glu Gly Met Glu Asn Val Ser Trp Asp Pro					
		515		520	525
Ile Lys Lys Ser Asp Glu Val Tyr Lys Cys Leu Asn Ile Ser Asp Glu					
		530		535	540
Leu Lys Met Ile Asp Val Pro Glu Met Asp Lys Ile Lys Gln Trp Glu					
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Ser Met Phe Glu Lys His Arg Asp Leu Phe					
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<210> 9

<211> 1713

<212> DNA

<213> *Lucilia cuprina*

<400> 9

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ccctgggatg gtgtgcggtga ttgttgcaat cataaagata agtcagtga agttgatttt 300
ataacgggca aagtgtgtgg ctacagaggat tgtctatacc taagtgtcta tacgaataat 360
ctaaatcccc aaactaaacg tcccgtttta gtatacatat atggtggtgg ttttattatc 420

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aatgtgcgca actttgggtg caatcccgat aatattacag tctttgggtg aagtgccggt 660
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<210> 10

<211> 570

<212> PRT

<213> *Lucilia cuprina*

<400> 10

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Cys Ile Glu Asn Lys Phe Leu Asn Tyr Arg Leu Thr Thr Asn Glu Thr
      20              25              30

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Val Val Ala Glu Thr Glu Tyr Gly Lys Val Lys Gly Val Lys Arg Leu
      35              40              45

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Thr Val Tyr Asp Asp Ser Tyr Tyr Ser Phe Glu Gly Ile Pro Tyr Ala
      50              55              60

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Gln Pro Pro Val Gly Glu Leu Arg Phe Lys Ala Pro Gln Arg Pro Thr
      65              70              75              80

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Pro Trp Asp Gly Val Arg Asp Cys Cys Asn His Lys Asp Lys Ser Val
      85              90              95

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Gln Val Asp Phe Ile Thr Gly Lys Val Cys Gly Ser Glu Asp Cys Leu
      100             105             110

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Tyr Leu Ser Val Tyr Thr Asn Asn Leu Asn Pro Glu Thr Lys Arg Pro
      115             120             125

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Val Leu Val Tyr Ile His Gly Gly Gly Phe Ile Ile Gly Glu Asn His
      130             135             140

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Arg Asp Met Tyr Gly Pro Asp Tyr Phe Ile Lys Lys Asp Val Val Leu
      145             150             155             160

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Ile Asn Ile Gln Tyr Arg Leu Gly Ala Leu Gly Phe Leu Ser Leu Asn
165 170 175

Ser Glu Asp Leu Asn Val Pro Gly Asn Ala Gly Leu Lys Asp Gln Val
180 185 190

Met Ala Leu Arg Trp Ile Lys Asn Asn Cys Ala Asn Phe Gly Gly Asn
195 200 205

Pro Asp Asn Ile Thr Val Phe Gly Glu Ser Ala Gly Ala Ala Ser Thr
210 215 220

His Tyr Met Met Leu Thr Glu Gln Thr Arg Gly Leu Phe His Arg Gly
225 230 235 240

Ile Leu Met Ser Gly Asn Ala Ile Cys Pro Leu Ala Asn Thr Gln Cys
245 250 255

Gln His Arg Ala Phe Thr Leu Ala Lys Leu Ala Gly Tyr Lys Gly Glu
260 265 270

Asp Asn Asp Lys Asp Val Leu Glu Phe Leu Met Lys Ala Lys Pro Gln
275 280 285

Asp Leu Ile Lys Leu Glu Glu Lys Val Leu Thr Leu Glu Glu Arg Thr
290 295 300

Asn Lys Val Met Phe Pro Phe Gly Pro Thr Val Glu Pro Tyr Gln Thr
305 310 315 320

Ala Asp Cys Val Leu Pro Lys His Pro Arg Glu Met Val Lys Thr Ala
325 330 335

Trp Gly Asn Ser Ile Pro Thr Met Met Gly Asn Thr Ser Tyr Glu Gly
340 345 350

Leu Phe Phe Thr Ser Ile Leu Lys Gln Met Pro Met Leu Val Lys Glu
355 360 365

Leu Glu Thr Cys Val Asn Phe Val Pro Ser Glu Leu Ala Asp Ala Glu
370 375 380

Arg Thr Ala Pro Glu Thr Leu Glu Met Gly Ala Lys Ile Lys Lys Ala
385 390 395 400

His Val Thr Gly Glu Thr Pro Thr Ala Asp Asn Phe Met Asp Leu Cys
405 410 415

Ser His Ile Tyr Phe Trp Phe Pro Met His Arg Leu Leu Gln Leu Arg
420 425 430

Phe Asn His Thr Ser Gly Thr Pro Val Tyr Leu Tyr Arg Phe Asp Phe
435 440 445

Asp Ser Glu Asp Leu Ile Asn Pro Tyr Arg Ile Met Arg Ser Gly Arg
450 455 460

Gly Val Lys Gly Val Ser His Ala Asp Glu Leu Thr Tyr Phe Phe Trp
 465 470 475 480
 Asn Gln Leu Ala Lys Arg Met Pro Lys Glu Ser Arg Glu Tyr Lys Thr
 485 490 495
 Ile Glu Arg Met Thr Gly Ile Trp Ile Gln Phe Ala Thr Thr Gly Asn
 500 505 510
 Pro Tyr Ser Asn Glu Ile Glu Gly Met Glu Asn Val Ser Trp Asp Pro
 515 520 525
 Ile Lys Lys Ser Asp Glu Val Tyr Lys Cys Leu Asn Ile Ser Asp Glu
 530 535 540
 Leu Lys Met Ile Asp Val Pro Glu Met Asp Lys Ile Lys Gln Trp Glu
 545 550 555 560
 Ser Met Phe Glu Lys His Arg Asp Leu Phe
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<210> 11
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 <212> DNA
 <213> *Lucilia cuprina*

<400> 11
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<210> 12
 <211> 28
 <212> DNA
 <213> *Lucilia cuprina*

<400> 12
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<210> 13
 <211> 570
 <212> PRT
 <213> *Musca domestica*

<400> 13
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 20 25 30
 Gln Ile Ile Asp Thr Glu Tyr Gly Gln Ile Lys Gly Val Lys Arg Met
 35 40 45
 Thr Val Tyr Asp Asp Ser Tyr Tyr Ser Phe Glu Ser Ile Pro Tyr Ala
 50 55 60
 Lys Pro Pro Val Gly Glu Leu Arg Phe Lys Ala Pro Gln Arg Pro Val
 65 70 75 80

Pro Trp Glu Gly Val Arg Asp Cys Cys Gly Pro Ala Asn Arg Ser Val
 85 90 95
 Gln Thr Asp Phe Ile Ser Gly Lys Pro Thr Gly Ser Glu Asp Cys Leu
 100 105 110
 Tyr Leu Asn Val Tyr Thr Asn Asp Leu Asn Pro Asp Lys Arg Arg Pro
 115 120 125
 Val Met Val Phe Ile His Gly Gly Asp Phe Ile Phe Gly Glu Ala Asn
 130 135 140
 Arg Asn Trp Phe Gly Pro Asp Tyr Phe Met Lys Lys Pro Val Val Leu
 145 150 155 160
 Val Thr Val Gln Tyr Arg Leu Gly Val Leu Gly Phe Leu Ser Leu Lys
 165 170 175
 Ser Glu Asn Leu Asn Val Pro Gly Asn Ala Gly Leu Lys Asp Gln Val
 180 185 190
 Met Ala Leu Arg Trp Val Lys Ser Asn Ile Ala Ile Phe Gly Gly Asp
 195 200 205
 Val Asp Asn Ile Thr Val Phe Gly Glu Ser Ala Gly Gly Ala Ser Thr
 210 215 220
 His Tyr Met Met Ile Thr Glu Gln Thr Arg Gly Leu Phe His Arg Gly
 225 230 235 240
 Ile Met Met Ser Gly Asn Ser Met Cys Ser Trp Ala Ser Thr Glu Cys
 245 250 255
 Gln Ser Arg Ala Leu Thr Met Ala Lys Arg Val Gly Tyr Lys Gly Glu
 260 265 270
 Asp Asn Glu Lys Asp Ile Leu Glu Phe Leu Met Lys Ala Asn Pro Tyr
 275 280 285
 Asp Leu Ile Lys Glu Glu Pro Gln Val Leu Thr Pro Glu Arg Met Gln
 290 295 300
 Asn Lys Val Met Phe Pro Phe Gly Pro Thr Val Glu Pro Tyr Gln Thr
 305 310 315 320
 Ala Asp Cys Val Val Pro Lys Pro Ile Arg Glu Met Val Lys Ser Ala
 325 330 335
 Trp Gly Asn Ser Ile Pro Thr Leu Ile Gly Asn Thr Ser Tyr Glu Gly
 340 345 350
 Leu Leu Ser Lys Ser Val Ala Lys Gln Tyr Pro Glu Val Val Lys Glu
 355 360 365
 Leu Glu Ser Cys Val Asn Tyr Val Pro Trp Glu Leu Ala Asp Ser Glu
 370 375 380

Arg Ser Ala Pro Glu Thr Leu Glu Arg Ala Ala Ile Val Lys Lys Ala
385 390 395 400

His Val Asp Gly Glu Thr Pro Thr Leu Asp Asn Phe Met Glu Leu Cys
405 410 415

Ser Tyr Phe Tyr Phe Leu Phe Pro Met His Arg Phe Leu Gln Leu Arg
420 425 430

Phe Asn His Thr Ala Gly Thr Pro Ile Tyr Leu Tyr Arg Phe Asp Phe
435 440 445

Asp Ser Glu Glu Ile Ile Asn Pro Tyr Arg Ile Met Arg Phe Gly Arg
450 455 460

Gly Val Lys Gly Val Ser His Ala Asp Glu Leu Thr Tyr Leu Phe Trp
465 470 475 480

Asn Ile Leu Ser Lys Arg Leu Pro Lys Glu Ser Arg Glu Tyr Lys Thr
485 490 495

Ile Glu Arg Met Val Gly Ile Trp Thr Glu Phe Ala Thr Thr Gly Lys
500 505 510

Pro Tyr Ser Asn Asp Ile Ala Gly Met Glu Asn Leu Thr Trp Asp Pro
515 520 525

Ile Lys Lys Ser Asp Asp Val Tyr Lys Cys Leu Asn Ile Gly Asp Glu
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Leu Lys Val Met Asp Leu Pro Glu Met Asp Lys Ile Lys Gln Gly Ala
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Ser Ile Phe Asp Lys Lys Lys Glu Leu Phe
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<211> 1710

<212> DNA

<213> Musca domestica

<400> 14

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caaattaagg gtgttaagcg aatgaccgtc tacgatgatt cttactacag tttcgagagt 180
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ataagtggca aacccacagg ttcgaggat tgtctatacc tgaatgtgta taccaatgac 360
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gtaaccgtgc aatatcgttt ggggtgtgtg ggtttcctta gcctgaaatc ggaaaatctc 540
aatgtccccc gcaacgctgg cctcaaggat caagtaatgg ccttgagatg ggtcaagagt 600
aatattgcc aatttcggtg cgatgtagac aatattaccg tcttcggcga aagtgtgtgt 660
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atcatgatgt ccggtaatc catgtgctca tgggcctcta cagaatgcc aagtcgtgctg 780
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gaaagaatgc aaaataaggt catgtttcct tttggacca ctgtagaacc ataccagaca 960
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 atggaaaacc tcacctggga tcccataaaa aaatccgatg atgtctataa atgtttaaat 1620
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<212> PRT

<213> Musca domestica

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 20 25 30

Val Met Val Phe Ile His Gly Gly Gly Phe Ile Phe Gly Glu Ala Asn
 35 40 45

Arg Asn Trp Tyr Gly Pro Asp Tyr Phe Met Lys Lys Pro Val Val Leu
 50 55 60

Val Thr Val Gln Tyr Arg Leu Gly Val Leu Gly Phe Leu Ser Leu Lys
 65 70 75 80

Ser Glu Asn Leu Asn Val Pro Gly Asn Ala Gly Leu Lys Asp Gln Val
 85 90 95

Met Ala Leu Arg Trp Phe Lys Ser Asn Ile Ala Ile Phe Gly Gly Asp
 100 105 110

Val Asp Asn Ile Thr Val Phe Gly Glu Ser Ala Gly Gly Ala Ser Thr
 115 120 125

His Tyr Met Met Ile Thr Glu Gln Thr Arg Gly Leu Phe His Arg Gly
 130 135 140

Ile Met Met Ser Gly Asn Ser Met Cys Ser Ser Ala Ser Thr Glu Cys
 145 150 155 160

Gln Ser Arg Ala Leu Thr Met Ala Lys Arg Val Gly Tyr Lys Gly Glu
 165 170 175

Glu Asn Glu Lys Asp Ile Leu Glu Phe Leu Met Lys Ala Asn Pro Tyr
 180 185 190

Asp Leu Ile Lys Glu Glu Pro Gln Val Leu Thr Pro Glu Arg Met

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 <213> *Lucilia cuprina*

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<210> 19
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<210> 20
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<210> 21
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<210> 29
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<400> 29
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<210> 30

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<221> modified_base
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<223> i

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Primer

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<210> 32

<211> 22

<212> DNA

<213> Musca domestica

<400> 32

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22

<210> 33

<211> 24

<212> DNA

<213> Musca domestica

<400> 33

tgccacttat gaaatctgtc tgta

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<210> 34

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<213> Musca domestica

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<400> 38

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<210> 39

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<212> DNA

<213> Musca domestica

<400> 42

ggcatggaaa acctcacctg g 21

<210> 43

<211> 207

<212> PRT

<213> Lucilia cuprina

<400> 43

Gln Val Asp Phe Ile Thr Gly Lys Val Cys Gly Ser Glu Asp Cys Leu

1

5

10

15

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,			20					25					30		
Val	Leu	Val	Tyr	Ile	His	Gly	Gly	Gly	Phe	Ile	Ile	Gly	Glu	Asn	His
		35					40					45			
Arg	Asp	Met	Tyr	Gly	Pro	Asp	Tyr	Phe	Ile	Lys	Lys	Asp	Val	Val	Leu
	50					55					60				
Ile	Asn	Ile	Gln	Tyr	Arg	Leu	Gly	Ala	Leu	Gly	Phe	Leu	Ser	Leu	Asn
65					70					75					80
Ser	Glu	Asp	Leu	Asn	Val	Pro	Gly	Asn	Ala	Gly	Leu	Lys	Asp	Gln	Val
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Met	Ala	Leu	Arg	Trp	Ile	Lys	Asn	Asn	Cys	Ala	Asn	Phe	Gly	Gly	Asn
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Pro	Asp	Asn	Ile	Thr	Val	Phe	Gly	Glu	Ser	Ala	Gly	Ala	Ala	Ser	Thr
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His	Tyr	Met	Met	Leu	Thr	Glu	Gln	Thr	Arg	Gly	Leu	Phe	His	Arg	Gly
	130					135					140				
Ile	Leu	Met	Ser	Gly	Asn	Ala	Ile	Cys	Pro	Leu	Ala	Asn	Thr	Gln	Cys
145					150					155					160
Gln	His	Arg	Ala	Phe	Thr	Leu	Ala	Lys	Leu	Ala	Gly	Tyr	Lys	Gly	Glu
				165					170					175	
Asp	Asn	Asp	Lys	Asp	Val	Leu	Glu	Phe	Leu	Met	Lys	Ala	Lys	Pro	Gln
			180					185					190		
Asp	Leu	Ile	Lys	Leu	Glu	Glu	Lys	Val	Leu	Thr	Leu	Glu	Glu	Arg	
		195					200					205			